Battle Command: An Approach to Wickedness

A Monograph
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This monograph proposes that current Army doctrine provides an adequate tool to achieve the desired results proposed in the concepts of operational Design. Because Army doctrine prescribes approaches that solve problems, it is important to understand the nature of problems, especially as they relate to the operational environment. Problems range from well-structured, easily defined problems with attainable solutions; through medium-structured, difficult to define problems without routine solution; to ill-structured, problems without clear formulation or solution. There are two broad approaches to addressing ill-structured problems. First, a problem-focused approach which prioritizes a robust knowledge of the environment from which the problem has emerged. Second, a solution-focused approach that emphasizes the power of proposing solutions as the vehicle to gain understanding of the ill-structured problem. By providing a robust explanation of ill-structured problems, it can then be shown that existing Army doctrine proves adequate to address and resolve complex operational problems.

The doctrinal precept of Battle Command is the Army's solution-focused approach. Commanders must understand the nature of their environment, the disposition of the adversary, and the capabilities of friendly forces in order to frame the operational problem. From this understanding they visualize broad approaches to solve that problem. It is through that visualization of solution that commanders gain a true appreciation of the context of the problem. This monograph will demonstrate that the doctrinal precept of Battle Command provides a complete expression for addressing ill-structured problems.

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Abstract

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There may be a doctrinal showdown forming. On one side is the stalwart legacy of Army doctrine with its heritage of systematic processes, catchy acronyms, checklisted approaches, and historically proven results. On the other side, a xenophilic contender with selected philosophic underpinnings from a vast array of theories and professional practices, with a complicated, if not unintelligible lexicon, suggesting a method without methodology, and possessing a historically ambiguous application. This forming showdown centers on whether-or-not the military has recognized the increasing complexity of framing the problems encountered in the operational environment. Further, the proponents of the contending approach, referred to as Design, argue that existing Army doctrine is insufficient to address these complex problems. However, many practitioners argue that the Army successfully addresses problems in this complex environment every day. What both sides have failed to do is adequately survey existing Army doctrine to determine whether sufficient methodology already exists. In surveying doctrine, the sides may discover that it is not one or the other, but rather one fits within the other.

This monograph proposes that current Army doctrine provides an adequate tool to achieve the desired results proposed in the concepts of operational Design. Because Army doctrine prescribes approaches that solve problems, it is important to understand the nature of problems, especially as they relate to the operational environment. Problems range from well-structured, easily defined problems with attainable solutions; through medium-structured, difficult to define problems without routine solution; to ill-structured, problems without clear formulation or solution. There are two broad approaches to addressing ill-structured problems. First, a problem-focused approach which prioritizes a robust knowledge of the environment from which the problem has emerged. Second, a solution-focused approach that emphasizes the power of proposing solutions as the vehicle to gain understanding of the ill-structured problem. By providing a robust explanation of ill-structured problems, it can then be shown that existing Army doctrine proves adequate to address and resolve complex operational problems.

The doctrinal precept of Battle Command is the Army's solution-focused approach. Commanders must understand the nature of their environment, the disposition of the adversary, and the capabilities of friendly forces in order to frame the operational problem. From this understanding they visualize broad approaches to solve that problem. It is through that visualization of solution that commanders gain a true appreciation of the context of the problem. This monograph will demonstrate that the doctrinal precept of Battle Command provides a complete expression for addressing ill-structured problems.

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Introduction

There may be a doctrinal showdown forming. On one side is the stalwart legacy of Army doctrine with its heritage of systematic processes, catchy acronyms, checklisted approaches, and historically proven results. On the other side, a xenophilic contender with selected philosophic underpinnings from a vast array of theories and professional practices, with a complicated, if not unintelligible lexicon, suggesting a method without methodology, and possessing a historically ambiguous application. This forming showdown centers on whether-or-not the military has recognized the increasing complexity of framing the problems encountered in the operational environment. Further, the proponents of the contending approach, referred to as Design, argue that existing Army doctrine is insufficient to address these complex problems. However, many practitioners argue that the Army successfully addresses problems in this complex environment every day. What both sides have failed to do is adequately survey existing Army doctrine to determine whether sufficient methodology already exists. In surveying doctrine, the sides may discover that it is not one or the other, but rather one fits within the other.

The current concepts of Design intend to provide a method to address complex operational environments. The complex operational environment can be best expressed as an ill-structured problem.[1] Ill-structured problems describe the issues in the complex operational environment where neither the problem nor the solution can be easily defined. The proponents of Design argue that existing planning doctrine has proven insufficient for addressing the demands of today's more complex operational environment, and, therefore, insufficient to resolve ill-structured problems.[2] "Design provides a means to conceptualize and hypothesize about the underlying

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[1] Department of the Army. TRADOC PAM 525-5-500, *Commander's Appreciation and Campaign Design*, (Washington, DC: Government Printing Office, 2008), 8.

[2] For example see: Stefan J. Banach, "Educating by Design: Preparing Leaders for a Complex World." Military Review, 2009: 96-104. Stefan J. Banach, and Alex Ryan. "The Art of Design: A Design Methodology." Military Review, 2009: 105-115. Shimon Naveh, Huba Wass de Czege, John Lockhart Clark and Jeffrey Powell, with Richard Swain. Operational Design: Operational Art for the 21st Century

causes and dynamics that explain an unfamiliar problem. Design provides a means to gain understanding of a complex problem and insights towards achieving a workable solution."[3] Thus, the argument states that only a bold new approach to gaining a deeper understanding of the nature of the operational environment will reveal the underlying factors of the ill-structured problem. Consequently, from this more complete understanding a holistic, creative, and complete approach to the problem's resolution will emerge.[4] However, this approach fails to recognize the problem solving culture of the United States Army and the very nature of ill-structured problems. This monograph proposes that current Army doctrine provides an adequate tool to achieve the desired results proposed in the concepts of operational Design.

There are two broad approaches to addressing ill-structured problems.[5] Both approaches seek to understand the complex environment in order to frame a resolvable problem; this problem-framing is referred to as problematization.[6] Each also seeks to resolve ill-structured problems. The difference is the methodology they adopt to achieve problematization. First, a problem-focused approach which prioritizes a robust knowledge of the environment from which the problem has emerged. From this in-depth study of the environment a solution will become evident to the commander. Problematization emerges from the study of the problem. Second, a solution-focused approach that emphasizes the power of proposing solutions as the vehicle to

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(Draft). Booz, Allen, Hamilton. John F. Schmitt, *A Systemic Concept for Operational Design.* October 1, 2007. http://www.au.af.mil/au/awc/awcgate/usmc/mcwl_schmitt_op_design.pdf (accessed April 25, 2009). Huba Wass de Czege, "Systemic Operational Design: Learning and Adapting in Complex Missions." *Military Review*, 2009: 2-12.

[3] *School of Advanced Military Studies. Student Text, Version 1.0, "Art of Design,"(Fort Leavenworth, KS: Government Printing Office, 2008),* 17.

[4] Ibid., 34.

[5] Bryan Lawson. *How Designers Think: The Design Process Demystified,* (4th ed. Burlington, MA: Architectural Press, 2006), 43. Author's construct based on Lawson. Construct covered in detail in Section Two.

[6] "To propose problems." problematize. Dictionary.com. *Webster's Revised Unabridged Dictionary*. MICRA, Inc. http://dictionary.reference.com/browse/problematize (accessed: February 10, 2009).

gain understanding of the ill-structured problem. This approach requires the commander to look at a variety of solutions in order to determine the impact on the environment from which the problem emerged. Problematization occurs based on an understanding of how the proposed solution impacts the environment surrounding the problem.

Because Army doctrine prescribes approaches that solve problems, it is important to understand the nature of problems, especially as they relate to the operational environment. Problems range from well-structured, easily defined problems with attainable solutions; through medium-structured, difficult to define problems without routine solution; to ill-structured, problems without clear formulation or solution. [7] An ill-structured problem has inadequate information available, with multiple variables acting on it, and proves difficult to predict or forecast. [8] Many of the issues found in the current operational environment can be categorized as ill-structured problems. Because of this, it may take multiple solutions conducted concurrently and/or sequentially to resolve; operationally, this meets the definition of a campaign. [9] It is crucial to understand that not all operational problems are ill-structured. Presupposing that all operational problems are complex and require refined methodology could potentially, and ironically, over-simplify the problem universe by making all problems ill-structured. The doctrinal definition of an ill-structured problem is a simplification of Horst W.J. Rittel and Melvin M. Webber's 1973 article, "Dilemmas in a General Theory of Planning." This article introduced the term "Wicked Problem" and provides a classification methodology for categorizing problems as wicked. [10] Since Rittel and Webber's publication, a multitude of authors have adopted, expanded, modified, and

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[7] Department of the Army. *Field Manual (FM) 5-0, Army Planning and Orders Production, (Washington, DC: Government Printing Office, 2005)*, 2-5.

[8] Ibid., 2-5.

[9] Ibid., 2-5.

[10] Campaign. "A series of related major operations aimed at achieving strategic and operational objectives within a given time and space." JP 1-02. Additionally, CACD expands on the FM 5.0 definition of ill-structured and aligns ill-structured as synonymous to wicked.

explained the concept of problem wickedness. Several of these authors will be cited in Section Two in order to demonstrate the universality of the concept of wickedness within the taxonomy of ill-structured problems. By providing an explanation of ill-structured problems, it can then be shown that existing Army doctrine proves adequate to address and resolve complex operational problems.

The doctrinal precept of Battle Command is the Army's solution-focused approach. Battle Command describes the role of the commander in the Operations Process.[11] Commanders must understand the nature of their environment, the disposition of the adversary, and the capabilities of friendly forces in order to frame the operational problem.[12] From this understanding they visualize broad approaches to solve that problem.[13] It is through that visualization of solution that commanders gain a true appreciation of the context of the problem.[14] Commanders then describe their understanding and visualization to their subordinate commanders and staffs.[15] By describing their conceptualized solution, they may direct the organization to achieve that desired state. In order to be successful, commanders must lead their organization through the operations process, while continuously assessing both the relevance of the problem as well as the viability of the solution. These steps of Battle Command occur simultaneously and continuously throughout the Operations Process.[16] Doctrinally, Battle Command suffers from being developed and expanded over time without a complete articulation in any one manual.[17] Section four assimilates the

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[11] Department of the Army. *Field Manual (FM) 6-0, Mission Command: Command and Control of Army Forces.* (Washington, DC: Government Printing Office, 2003), 4-1.

[12] Department of the Army. *Field Manual (FM) 3-0, Operation,* (Washington, DC: Government Printing Office, 2008), 4-2.

[13] FM 6-0, 6-6.

[14] TRADOC PAM 525-5-500, 17.

[15] FM 6-0, 4-7.

[16] FM 6-0, 4-6.

[17] Descriptions and explanations of Battle Command occur in an array of manuals, FM 3-0, FM 5-0, FM 6-0, and FM 6-22 provide the primary explanations. With the publication of the revised FM 3-0 in

collective knowledge of doctrine, and those who commentate on doctrine, into a more complete explanation of the precept. This refined understanding allows the reader to see how Battle Command can be applied to the ill-structured problems of a complex operational environment.

Finally, this monograph will demonstrate that the doctrinal precept of Battle Command provides a complete expression for addressing ill-structured problems. By taking a refined understanding of the precept of Battle Command and overlaying the taxonomy of wicked problems, it becomes clear that these doctrinal structures provide an existing approach to addressing ill-structured operational problems. Through this approach, one can begin to see how the applying of creative reason in order to understand the problem relates to the creative thinking required to visualize the solution. It is this promise of a "reflective conversation" between problem and solution that exposes the promise of Battle Command.[18] This monograph limits itself to the doctrinal expression and does not provide survey or investigation of the training or implementation of Battle Command.

This monograph is laid out in three sections and a conclusion. The first section sets the stage by describing the two broad approaches to resolving ill-structured operational problems. The second section introduces Rittel and Webber's properties of wicked problems as a complete taxonomy for categorizing a problem as ill-structured. The third section will describe and explain Battle Command. The fourth section will then demonstrate how the application of Battle Command allows the commander a sufficient methodology to address ill-structured problems. This will provide the reader with a deeper understanding of existing doctrinal process and clearly

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February 2008, the concept of Understand was separated from Visualize. To date, that version of the FM 3-0 provides the only comprehensive explanation or that separation. This is discussed in greater detail in Section Three.

[18] Donald A. Schon. *The Reflective Practitioner: How Professionals Think in Action.* (New York: Basic Books, 1983), 76.

demonstrate the sufficiency of current doctrine in successfully addressing the modern complex operational environment.

Approaches to Wickedness

In understanding why Battle Command is sufficient to address ill-structured problems, it is necessary to understand the difference in how the concepts of Design and current doctrine approach ill-structured problems. Regardless of which approach applied or adopted, each aim to resolve ill-structured problems by understanding the context of the environment, then translating that understanding into an addressable problem, and then conceptualizing a solution. The important thing to do is to discover what side of the problem-solution equation the individual method focuses on. This section introduces two approaches, problem-focused and solution-focused, to addressing ill-structured problems. Additionally, the concept of problematization is defined and addressed as a component of the concepts of Design that is inherent, but not described, in current Army doctrine. This explanation will provide the context to demonstrate that doctrine already provides a sufficient methodology to address ill-structured problems.

However, before continuing, the reader must understand how both the concept and doctrine utilize the word 'design.' There is no attempt by either to conform to the definition provided by the other.[19] Therefore, it is important to address the polysemous nature of the word 'design.'[20] Doctrine defines operational design as "the conception and construction of the framework that

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[19] It would be a fair criticism of the concept of Design, that it almost purposely uses words of a common military meaning in uncommon ways. Thus, attempting to decipher Design literature requires the military professional to divorce themselves from the common doctrinal lexicon in order to understand the meaning ascribed by the author.

[20] Polysemous. A polyseme is a word or phrase with multiple, related meanings. A word is judged to be polysemous if it has two senses of the word whose meanings are related. The difference between homonyms and polysemes is subtle. Lexicographers define polysemes within a single dictionary lemma, numbering different meanings, while homonyms are treated in separate lemmata. http://www.reference.com/browse/polysemous (accessed April 28, 2009)

underpins a campaign or major operation plan and its subsequent execution."[21] In fact, doctrine uses design in its definition of a plan; "a design for a future or anticipated operation."[22] From this, one can deduce that doctrine sees design as providing underlying structure, or framework, to the solution. The School of Advanced Military Studies (SAMS) Student Text, *Art of Design* (AoD), defines Design as a proper noun which "refers more narrowly to the broad problem solving approach… based on a systemic and shared understanding."[23] Design "seeks to explain the qualitative relationships embedded within ill-structured problems, including their history, tensions, propensity, and trends."[24] From this, one can deduce that Design seeks to add structure, or a framework, to the problem. Both design and Design recognize the importance of both sides of the problem/solution coin; it is simply a matter of where the intellectual energy is focused. Therefore, a design must include an understanding of the problem and Design must include some visualization of the solution. Thus, for the purpose of this monograph, design will be used as a capitonym: design, as the doctrinal definition referring to the structure of a solution, and Design, as the body of concepts that focus on the structure of a problem.[25]

Bryan Lawson, in *How Designers Think*, reviews research conducted on problem solving strategies adopted by scientists and architects. Lawson explains, "The essential difference between these two strategies is that while the scientists focused their attention on understanding the underlying rules, the architects were obsessed with achieving the desired result."[26] He ascribes

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[21] JP 1-02, http://www.dtic.mil/doctrine/jel/doddict/data/o/03887.html (Accessed: February 18, 2009). CACD quotes JP 1-02 and provides this definition: "The key considerations used as a framework in the course of planning for a campaign or major operation."

[22] FM 5-0, Glossary-16.

[23] Student Text, 19.

[24] Ibid., 18.

[25] A capitonym is a word that changes its meaning (and sometimes pronunciation) when it is capitalized, and usually applies to capitalization due to proper nouns or eponyms. http://www.reference.com/browse/Capitonym (accessed April 28th, 2009)

[26] Lawson, 43.

this differentiation in approach to the attributes of the educational experience of the two professions. Scientists come from a theoretical background and tradition that values method. Having a method makes individual findings, or solutions, replicable by others. Lawson terms this a "problem-focused [strategy] approach."[27] Architects hail from a background of "reflection-in-action;" hands on training through practicum or studio, where the quality of the solution, rather than the method of achievement, reigns supreme.[28] Architecture students use a "strategy of analysis through synthesis. They learned about the problem through attempts to create solutions rather than through deliberate and separate study of the problem itself."[29] Lawson terms this a "solution-focused [strategy] approach."[30] He is careful not to provide value judgment on either approach and recognizes, "both groups of design students showed greater skill than their peers in actually forming the […] solution."[31] The very characteristic of having an approach, a method, or a process to guide the thinking about a problem, assisted the group in achieving a solution.

Therefore, broadly speaking, there are two ways to approach an ill-structured problem. First, through a problem-focused approach that emphasizes a thorough understanding of the problem, as well as the rules or constraints surrounding that problem, *before* proposing a solution. As AoD notes, "Design inquires into the nature of a problem to conceive a framework for solving that problem."[32] The proponents of Design argue that by deriving a more complete understanding of the nature of the problem, a singular solution or explanation will emerge.[33] Based on this

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[27] Lawson, 43. For the purpose of this monograph the synonym "approach" will be used in lieu of "strategy."

[28] Donald A. Schön. *Educating the Reflective Practitioner: Toward a New Design for Teaching and Learning in the Professions,* (1st ed. San Francisco: Jossey-Bass, 19900, 22.

[29] Lawson, 44.

[30] Ibid. 43

[31] Ibid. 44

[32] Student Text, 17.

[33] See for example: Banach and Ryan, 111-112. Wass de Czege, 11. AoD, 34-35. All three discuss a solution as a singular approach arrived at by the discourse of the Design group. Unlike planning

categorization, a problem-focused approach encompasses the concepts of Design. As Colonel

Pete Blaber (United States Army Retired) states, "I discovered that once the man on the ground

begins describing the situation [the problem] in front of him, he almost always ends up revealing

the solution nested within his description."[34]

Design provides a problem-focused approach with strong lineage and deep roots to the Israeli

concept of Systemic Operational Design (SOD).[35] It draws heavily from the post-World War One

development of Soviet operational art, French post-modernist philosophy, and Chinese

philosophy.[36] From this, SOD proposes a skeptical, holistic, systems centered approach.[37] This

approach provides a systemic understanding of both the environment and the adversary that

allows the commander to exploit system propensities in order to alter the system towards a

general band of tolerance. As highlighted in AoD, "The creative application of domain

knowledge to the unique characteristics of a new situation is called Design. In military operations,

the practice of Design complements the planning process, by providing a structured approach to

operational art."[38] For the sake of this monograph, the concepts of Design are based on SOD, The

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methodologies, Design does not offer, or even recommend, a methodology to test the proposed solution
against some form of evaluation criteria (course of action analysis or war gaming).

[34] Pete Blaber. *The Mission, the Men, and Me: Lessons from a Former Delta Force Commander*,
(1st ed. New York: Berkley Caliber, 2008), 258.

[35] This is an observational assessment, both from the education of Design offered at SAMS, as
well as from the review of the available literature. American expressions of Design use similar, if not
identical, phraseology as SOD, often cite works by Dr. Shimon Naveh, and contain near identical three
frame approaches. Prior research showed that the original theory of Systemic Operational Design entered
the US Army as a concept following UNIFIED QUEST 2004 and was initially tested by a small group from
SAMS at UNIFIED QUEST 2005. See SAMS Monograph: *Systemic Operational Design: an Introduction*
and Milan Vego's "A Case Against Systemic Operational Design."

[36] Milan N. Vego. "A Case Against Systemic Operational Design." *Joint Force Quarterly*, 2009:
70.

[37] Huba Wass de Czege. "Systemic Operational Design: Learning and Adapting in Complex
Missions." *Military Review*, 2009: 7-8.

[38] Student Text, 23. Definition: Domain Knowledge- the user's mental model of a system – useful
interacting with the system and explaining or predicting its behavior (The Cognitive Psychology of
Knowledge, By Gerhard Strube, Karl Friedrich Wender)

SAMS Student Text – *The Art of Design* (AoD), and TRADOC PAM 525-5-500, *Commander's Appreciation and Campaign Design* (CACD).[39]

SOD is the foundational theory underpinning all the Design concepts. According to Major Barret M. Bernard in his monograph, *Systemic Operational Design: Bringing Efficacy to the Operational Level of War*, "SOD is a critical method, not a decision procedure. [SOD] is a process that involves the conduct of five separate but interrelated discourses to identify, refine, and translate a problem contained in strategic directive into an operational framework that enables planning."[40] AoD is the SAMS interpretation and attempt at 'Americanizing' SOD for utilization and implementation by the Army and, specifically, the edification of the Academic Year (AY) 2009 Advanced Military Studies Program (AMSP). AoD retains the SOD terms of 'Systems Frame' and 'Operations Frame,' but eliminates the separate discourses on Rival, Logistics, and Command.[41] Instead it relies on the practitioner developing a holistic understanding the systemic nature of the operational problem to derive a problem statement and theory of action "to move from the observed Systems Frame to the desired state."[42] CACD is the approved Army concept of Design. CACD is "an integrated approach to campaign design that draws from a wide range of sources: recent operational experience, UQ 2003 [UNIFIED QUEST] through UQ 2007, traditional American and Soviet approaches to operational art, SOD, and

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[39] This recognizes that FM 5.2, *Commander's Appreciation and Campaign Design*, is in draft and may be published as the doctrinal, and thus official, version of Design prior to publication of this Monograph.

[40] Barrett M. Bernard, *Systemic Operational Design: Bringing Efficacy to the Operational Level of War* (School of Advanced Military Studies Monographs. Fort Leavenworth, KS: US Army Command and General Staff College, 2007), 1.

[41] In the text of AoD there is no mention of the discourse on the three logics (Rival, Command, and Logistics). However, Appendix two, three, and four retain example metaquestions derived from SOD to help identify these logics. The appendices are not cited in the text. See *Student Text, Version 1.0: Art of Design*. 51-55.

[42] Student Text, 34. Interestingly, in Naveh's *Operational Art and the IDF: A Critical Study of Command Culture*, he identifies three flaws of American Operational Art. The third flaw, "the abstention of US Army theoreticians from dividing operational, art as a discipline, into subcategores or thematic fields." Written in 1997, this is a fairly prescient explanation of the adaptation of SOD for American use.

effects based thinking."[43] Although unique in individual construct, all three concepts focus the practitioner's efforts on understanding the problem before proposing a solution.

Once a problem has been recognized, it must be framed and set. This process of problem framing to problem setting is referred to as problematization. Major Edward P. W. Hayward, RHG/D (British Army) provides two definitions of problematization in his Monograph, *Planning Beyond Tactics: Towards a Military Application of the Philosophy of Design in the Formulation of Strategy*. First he defines it as a verb, "a <u>critical</u> and <u>pedagogical dialogue</u> or process that may be considered demythicisation. Rather than taking the <u>common knowledge (myth)</u> or a situation for granted, problematization poses that knowledge as a problem, allowing new viewpoints, <u>consciousness</u>, reflection, hope, and <u>action</u> to emerge [emphasis in the original]."[44] By this definition, a commander problematizes when he develops an appreciation for the underlying problem, not necessarily the problem as provided. Then, Hayward defines it as a noun, "The problematization is the link from a systemic understanding to the construction of the operational frame: the first act of 'design' and the expression of strategic choice."[45] AoD proposes a product, "a short concise problem statement which highlights the essence of the issues confronting the

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[43] *TRADOC PAM 525-5-300 : The United States Army Full Spectrum Operations - Unified Quest 2007* (Washington, DC: U.S. Department of the Army, 2008), 43. Page 5 defines UNIFIED QUEST as "the title given to the annual series of workshops, seminars, seminar war games, staff planning exercises, and, in the end, a moderated seminar war game conducted specifically for the Chief of Staff, United States Army (CSA), and others who either hold key leadership and policy development positions or influence those who hold them. Throughout the course of the year, UQ events follow the pattern and guidance laid out by the FWSP, developed annually by staff of the Future Warfare Division (FWD) of the Army Capability Integration Center (ARCIC). This plan guides the Army's continuing study of the implications of the emerging and future strategic environment for the transforming Army, generally looking 15-30 years in the future, in order to determine any significant trends which might necessitate the development of new concepts. This, in turn, gives the Army what should be sufficient lead time to develop, test, and implement concepts and determine the need for specific, timely solutions."

[44] Edward P. W. Hayward, *Planning Beyond Tactics: Towards a Military Application of the Philosophy of Design in the Formulation of Strategy* (Combined Arms Research Library Digital Library. Fort Leavenworth, KS: US Army Command and General Staff College, 2008), 69.

[45] Ibid., 68.

political sponsor or senior military commander."[46] At problematization, the commander can be said to have developed an understanding of the nature of the problem and prepared himself to begin conceptualizing a solution. Within Battle Command, problematization implicitly occurs as the commander moves from understanding to visualization. Although not captured as an explicit product (like CCIR), this may prove an area for doctrinal improvement informed by the adoption of Design principles.

The concepts of Design provide two desired results: problem formulation (commander's appreciation) and solution conceptualization (campaign design).[47] This approach makes problem formulation, or problematization, central to the understanding and, through this more complete understanding, a singular operational option will emerge as the logical approach to implement solution.[48] In problem formulation, Design suggests that an open discourse between commander and staff allows the commander to discover the right problem to solve through a shared understanding of the complex operational problem.[49] This understanding of complex problems is produced through a creative, heuristic, and iterative process.[50] Creativity is "the ability to transcend traditional ideas, rules, patterns, relationships, or the like, and to create meaningful new ideas, forms, methods, interpretations, etc."[51] In Design, creativity implies approaching problems with a "blank slate" (*tabula rasa* – a blank mind) approach that allows the practitioner to develop a true appreciation of the unique problem without interference from previous experience or

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[46] Student Text, 33.

[47] TRADOC PAM 525-5-500, i.

[48] See footnote 33.

[49] See for example: Banach and Ryan, 108. Wass de Czege, 9-12. AoD, 18. Sorrells, et al., 22.

[50] *Student Text, Version 1.0: Art of Design*. 13. and *TRADOC PAM 525-5-500 : Commander's Appreciation and Campaign Design* (Washington, DC: U.S. Department of the Army, 2008), i.

[51] creativity. Dictionary.com. *Dictionary.com Unabridged (v 1.1)*. Random House, Inc. http://dictionary.reference.com/browse/creativity (accessed: February 03, 2009).

preconceived notion.[52] Heuristic is defined as, "of or relating to a usually speculative formulation serving as a guide in the investigation or solution of a problem."[53] In Design, heuristic is analogous to a focus on the command's continued learning. Design demands a continuous focus on the command's learning in order to empower the commander to both make accurate intuitive decisions, as well as to know when to reframe the problem.[54] However, it does not acknowledge or recognize either assessment or the development of commander's critical information requirements (CCIR) as part of a command's learning. Finally, problem formulation is iterative. This recognizes that the natures of problems evolve and change over time; that the practitioner needs to continuously, creatively, and heuristically reevaluate the formulated problem. This ongoing approach emphasizes the necessity that commanders must continue to learn and adapt to the ever changing operational environment around them.

In solution conceptualization, Design suggests the ability to resolve ill-structured problems over time.[55] In military parlance, this is referred to as operational art – the ability to develop campaign plans that link the strategic aims to the tactical actions.[56] The campaign plan emerges from the more complete shared understanding of the problem developed during problem formulation and provides a practical, logical, and disciplined approach to its implementation.[57] Practical is "adapted or designed for actual use."[58] Doctrinally, practical implies that the

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[52] Lawson, 159.

[53] heuristic. Dictionary.com. *The American Heritage® Dictionary of the English Language, Fourth Edition*. Houghton Mifflin Company, 2004. http://dictionary.reference.com/browse/heuristic (accessed: February 03, 2009).

[54] Sorrells, et al., 35.

[55] TRADOC PAM 525-5-500, 19.

[56] TRADOC PAM 525-5-500 says link tactical to strategic… however as an inductive process it moves from general to specific, and thus more accurately aligns strategic aims to tactical action.

[57] TRADOC PAM 525-5-500, 19-20.

[58] practical. Dictionary.com. *Dictionary.com Unabridged (v 1.1)*. Random House, Inc. http://dictionary.reference.com/browse/practical (accessed: February 03, 2009).

campaign plan is feasible and acceptable.[59] A logical approach to solution suggests that the

campaign design remains coherent with past actions (statements or events) and continues to guide

the command towards future goals. Doctrinally, logical is synonymous with suitable.[60] A

disciplined approach to solution suggests that the campaign plan must remain coherent with

policy (strategic) and doctrine (tactics) in achieving its solution. Thus, the resulting campaign

plan must conform to the doctrinal expectation of the implementer. This broad explanation of

solution provides the staff a framework from which to build a campaign plan to prioritize and

synchronize the forces' efforts in accomplishing the commander's objectives.[61]

The second way to address ill-structured problems is through a solution-focused approach

that proposes that a problem cannot be fully understood without proposing a solution. The very

process of proposing a solution illuminates the constraints and brings the values of other stake-

holders into view.[62] Solution proposing requires the development of multiple options and

recognition that the first solution proposed may only drive learning, thereby leading to the

iterative and evolutionary development of an implementable solution.[63] The proponents of a

solution-focused approach argue that when confronted with a novel situation, designers first try to

understand the problem, but then jump immediately to potential solutions, and finally revert back

in order to refine their understanding of said problem, in a continuous effort to achieve a solution

to the problem.[64] Military doctrine, whether service specific or joint, generally falls into the

solution-focused approach category. Doctrine central to land force planning, FM 5-0, *Army

Planning and Orders Production*, MCDP 5, *Planning*, MCWP 5-1, *Marine Corps Planning*

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[59] FM 5-0, 3-29.

[60] Ibid., 3-29.

[61] Banach and Ryan, 100-103.

[62] Jeffrey E. Conklin. *Dialogue Mapping: Building Shared Understanding of Wicked Problems*, (Hoboken, NJ: Wiley, 2006), 5.

[63] Ibid., 6.

[64] Ibid., 5.

Process, and *JP* 5-0, *Joint Operational Planning*, is firmly rooted in the solution-focused approach. However, operational doctrine produced after UNIFIED QUEST 2005 begins to show the influence of the emerging concepts of design through the adoption of some problem-focused approach concepts.[65]

Army doctrine provides a robust understanding of problem solving, decision making, operational art, and operational design, found primarily, in the 3-series and 5-series field manuals. Critics of doctrinal planning methodologies tend to focus narrowly on Field Manual 5-0, Chapter 3, and then often only to pages 3-11 to 3-58—The Military Decision Making Process.[66] This narrow view of military planning excludes an understanding of the fundamentals of planning (Chapter 1) and an understanding of the Army's approach to problem solving (Chapter 2) that necessarily inform the military professional of a more holistic approach to planning. Nor does this criticism capture the matriculation of Design principles into more recent Army doctrine. Both FM 3-0, *Operations*, and FM 3-07, *Stability Operations*, show clear influence from the ongoing discussions about Design. FM 3-24, *Counterinsurgency*, also contains a chapter that specifically addresses Design. Doctrine, with the exception of Chapter Four of FM 3-24, nests these emerging Design concepts within the existing solution-focused approach paradigm. Additionally, any explanation of the adequacy of current doctrine must additionally account for Field Manual Interim (FMI) 5-0.1, *The Operations Process,* FM 6-0, *Mission Command: Command and Control of Army Forces*, and FM 6-22, *Army Leadership* as foundational to an understanding of the current concepts of Battle Command.

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[65] UQ 2005 is the first time that the Army formally tests the concept of SOD as a method of systemic operational understanding. See William T. Sorrells, Glen R. Downing, Paul J. Blakesley, David W. Pendall, Jason K. Walk, and Richard D. Wallwork. *Systemic Operational Design: an Introduction.* Monograph, Fort Leavenworth, KS: US Army Command and General Staff College, 2005.)

[66] This specifically refers to the chart originally found on FM 3-24, 4-2, that associates the conceptual aspects with Design and the physical aspects with Planning (art versus science). This chart has been reused in both CACD and AoD to illustrate this difference. However FM 5-0, 1-3 – 1-4, discusses in detail the symbiotic relationship between art and science.

However to compare Design simply to planning amounts to little more than a strawman comparison between asynchronous methods that obfuscate a true comparison between the proposed doctrinal construct of Design and the existing doctrinal methodologies of planning. The proposed concepts of Design initiate actions by the Commander, and their staffs, in framing the ill-structured problem for the planning staffs to use the MDMP, leading to the misconception that it simply precedes planning. Then Design extends measures to drive learning well past the production of orders; again exceeding the normally associated limits of an operations planning activity. This expansion beyond the limits of a singular cognitive step in doctrine is not unique to Design. Army doctrine already provides a model to describe and explain this expanded cycle from planning through execution and calls it the Operations Process.[67] Within doctrine, planning occurs as one of the three steps of the Operations Process. The commander's role within the Operational Process is Battle Command.

On Wickedness

A problem, as defined by FM 5-0, is the "difference between the current state or condition and a desired state or condition."[68] In *Toward a Design Theory of Problem Solving*, David H. Jonassen adds that, "finding or solving for the unknown [the difference between the current and desired states] must have some social, cultural, or intellectual value."[69] Although simple in explanation, defining the nature of this difference categorizes the complexity and structure of the problem. Doctrine recognizes three categories: well, medium, and ill-structured problems (See Figure 1).[70] Well structured problems are formulaic—the problem is well understood and a verifiably correct solution exists. Medium structured problems are complicated—some effort

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[67] FM 3-0, 5-16.

[68] FM 5-0, 2-7.

[69] David H. Jonassen, "Toward a design theory of problem solving." *Educational Technology Research and Development* (December 2000), 65.

[70] FM 5-0, 2-5.

must be exerted to understand the nature of the problem and a variety of potential solutions exist. Ill-structured problems are complex—a clear formulation of either problem or solution does not exist. FM 5-0 highlights that, "The ability to recognize and effectively solve problems is an essential skill for Army leaders."[71]

	Well-Structured "Puzzle"	Medium-Structured "Structurally Complex Problem"	Ill-Structured "Wicked Problem"
Problem Structuring	The problem is self-evident. Structuring is trivial.	Professionals easily agree on its structure.	Professionals will have difficulty agreeing on problem structure and will have to agree on a shared starting hypothesis.
Solution Development	There is only one right solution. It may be difficult to find.	There may be more than one "right" answer. Professionals may disagree on the best solution. Desired end state can be agreed.	Professionals will disagree on: • How the problem can be solved. • The most desirable end state. • Whether it can be attained.
Execution of Solution	Success requires learning to perfect technique.	Success requires learning to perfect technique and adjust solution.	Success requires learning to perfect technique, adjust solution, and refine problem framing.
Adaptive Iteration	No adaptive iteration required.	Adaptive iteration is required to find the best solution.	Adaptive iteration is required both to refine problem structure and to find the best solution.

Figure 1 - Types of Problems and Solution Strategies[72]

The Rittel and Webber article, originally noted in the introduction, explains the inherent difficulty encountered by social scientists in approaching societal problems where values, as related both to defining the problem, as well as implementing a proposed solution, impacted the realm of the possible. The significance of the study is two-fold. First, it recognizes that "it has become less apparent where problem centers lie, and less apparent *where* and *how* we should

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[71] FM 5-0, 2-1.

[72] TRADOC PAM 525-5-500, 9.

intervene even if we do happened to know what aims we seek."[73] As such, wicked problems

demonstrate difficulty in being problematized; in fact, the problem is the problematization.

Second, it provides ten distinguishing properties of wicked problems in order to describe a

problem as wicked, or doctrinally, as ill-structured, and then, to explain the essential nature and

relevance of that property to resolving the problem.

In *Wicked Problems and Social Complexity*, Dr. Jeff Conklin applies Rittel and Webber's

theory to the problem solving activities within a group setting and conducts a design experiment

to determine how designers think through understanding the nature of the wicked problem and

arrive at solutions.[74] Conklin's study expands on the Rittel and Webber article by providing

experimentation and explanations to the properties that Rittel and Webber first described.

Lawson proposes fourteen properties of design problems, design solutions, and the design process

that roughly equate to the Rittel taxonomy and provide design examples more exemplar to the

military practitioner.[75] Schön uses the term "indeterminate zones of practice" to describe

problems that defy simple definition or readily identifiable solutions.[76] Although he does not

categorize these into a comprehensive list, the text provides fundamental insights to the

practitioner faced with an ill-structured problem.

Both AoD and CACD adopt versions of the Rittel and Webber definition and elements of a

wicked problem. CACD accepts the Rittel and Webber elements and stratifies them into a list of

eleven elements, or indicators, and co-labels "wicked" as "ill-structured" in order to align terms

with FM 5-0.[77] AoD adopts the CACD elements, but restates them in such a way that it materially

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[73] Horst W. J. Rittel and Melvin M. Webber, "Dilemmas in a general theory of planning." (*Policy Sciences*, June 1973), 159.

[74] Conklin, 4.

[75] Lawson, 120-125.

[76] Schön, 6.

[77] TRADOC PAM 525-5-500, 9.

changes the understanding of ill-structured problems.[78] The authors of AoD provide no explanation for the change in definition from Rittel and Webber, or from CACD, nor do they provide a study or an experiment to prove the validity of this alteration to the published theory. This altered explanation proves critical to supporting AoD's problem-focused approach to Design. AoD drops the sentence, "we cannot understand an ill-structured problem without proposing a solution" and replaces it with, "ill-structured problems have no fixed set of potential solutions."[79] This effectively eliminates any discussion of proposing a solution as formative to understanding the problem. Although AoD unilaterally redefines ill-structured problems, Rittel and Webber's taxonomy of properties will be used to demonstrate to applicability of using Battle Command as a solution-focused approach to resolving ill-structured problems. This section proposes seven tests based on the ten properties of wickedness to determine an approaches' efficacy in addressing wicked, or ill-structured, problems.

First, Rittel and Webber's taxonomy begins with the very essence of a wicked problem, stating, "there is no definitive formulation of a wicked problem… [that] … the formulation of a wicked problem is the problem!"[80] In formulating a problem, they recognize that, "problem understanding and problem resolution are concomitant to each other."[81] Therefore, the practitioner must propose solutions by distinguishing between the current state and the proposed state in order to clarify understanding of the problem. "Understanding the problem and conceiving a solution are identical and simultaneous cognitive processes."[82] Lawson recognizes this phenomenon as "design problems cannot be comprehensively stated," and cautions, "that many components of design problems cannot be expected to emerge until some attempt has been

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[78] Student Text, 14.

[79] TRADOC PAM 525-5-500, 10.

[80] Rittel and Webber, 161.

[81] Ibid., 161.

[82] TRADOC PAM 525-5-500, 10.

made at generating solutions."[83] Schön captures this same association between problem and solution as "reflection-in-action," that "in the midst of action, I [Schön] invented procedures to solve the problem, discovered further unpleasant surprises, and made further corrective inventions."[84] Conklin demonstrates in his experimentation that "problem understanding can only come from creating possible solutions and considering how they will work." Rittel recommends a planning approach that is "an argumentative process in the course of which an image of the problem and of the solution emerges gradually among the participants."[85] This challenges Hayward's definition of problematization as a singular step from problem to solution. Instead, it informs the practitioner that it is an iterative process that evolves from a reflective conversation between problem and solution. Thus, the first test for a successful approach to dealing with ill-structured problems must provide for an iterative and "reflective conversation" between problem and solution that informs problematization through the proposal of solution. [86]

Second, "wicked problems have a no stopping rule… planners terminate work on a wicked problem, not for reasons inherent in the 'logic' of the problem."[87] Commanders must move to problematize and initiate the detailed planning because no sufficient criteria for understanding exist and the causal chains that link the interactions of an open system go on without end.[88] Commanders must judge when the situation is good enough.[89] This "satisficing – stopping when you have a solution that is 'good enough'," usually occurs when the external factors of time constraints, orders from higher, or suitability of the solution in the eyes of the commander has

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[83] Lawson, 152.

[84] Schön, 27.

[85] Rittel, 162.

[86] Schön , 42.

[87] Rittel, 162.

[88] Ibid, 162.

[89] TRADOC PAM 525-5-500, 15-16.

been achieved.[90] Schön refers to this, potentially never ending conversation between problem and solution, as "a reflective conversation with the materials of a situation," and acknowledges that "at some point, [the designer] must move from a 'what if?' to a decision." [91] Lawson warns, "This does not mean that the designer is necessarily pleased with the solution, but perhaps unsatisfactory as it might be it represents the best that can be done."[92] Conklin finds in his study that, "it is a matter of creativity to devise potential solutions, and a matter of judgment to determine which are valid, which should be pursued and implemented."[93] Problem-focused approaches demonstrate difficulty with a satisficing problematization, the agreeing on "the right level on which to tackle such problems."[94] Solution-focused approaches, like military doctrine, are criticized with accepting a satisficing solution without the 'reflective conversation' that may have better informed problem understanding. The second test must demonstrate that a doctrinal approach allows the commander to iteratively problematize with the awareness that he must eventually end the reflective conversation in order to produce an accurate and timely solution

Third, "solutions to wicked problems are not true-or-false, but good-or-bad."[95] This relates to the very nature of social problems, that bias, values, and judgment, necessarily inform the observer's perception of the nature of the problem and therefore the adequacy of a solution. Different practitioners are likely to devise different solutions because they perceive problems differently.[96] At the operational level of military organization, the number of interested parties, agencies, stakeholders, and participants precludes a collectively correct answer, only the

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[90] Conklin, 7.

[91] Schön, 42 and 62.

[92] Lawson, 123.

[93] Conklin, 8.

[94] Lawson, 121.

[95] Rittel, 162.

[96] Lawson, 120.

satisficing solution of compromise; "getting the right answer is not as important as having stakeholders accept whatever solution emerges."[97] This links to the fourth property, "there is no immediate and no ultimate test of a solution to a wicked problem." Without the ability to determine true-or-false, or right-or-wrong, any test of solution is bounded by the values of the observer. The challenge is to discover the unique criteria by which to test the solution. Without accepting a fixed set of criteria that may lend a sense of certainty to an inherently uncertain situation.[98] Also, due to the complex nature of wicked problems, the implemented solution will result in unintended consequences. "Design solutions can never be perfect and are often more easily criticized than created."[99] Therefore, a third test would be to show that any approach to resolving wicked problems must provide the unique criteria to test the validity and acceptability of the proposed solution with an understanding that the commander may need to seek out those criteria from other stakeholders.

Fifth, "every solution to a wicked problem is a 'one-shot operation;' because there is no opportunity to learn by trial-and-error, every attempt counts significantly."[100] The acting on a complex-adaptive system causes the system to alter structure and may significantly change the reaction to future action.[101] Schön states, "as the designer reflects-in-action on the situation created by his earlier moves, he must consider not only the present choice but the tree of further choices to which it leads, each of which has different meanings in relation to the systems of implications set up by earlier moves."[102] For example, once the invasion of Iraq began, it could

[97] Conklin, Jeffrey E., and William Weil. *Lean Construction Institute,* (October 14, 1998. http://www.leanconstruction.org/pdf/wicked.pdf (accessed March 15, 2009)), 3.

[98] Lawson, 72.

[99] Ibid., 122.

[100] Rittel, 163.

[101] Robert M. Axelrod and Michael D. Cohen. *Harnessing Complexity: Organizational Implications of a Scientific Frontier.* (New York: Basic Books, 2000), 109-110.

[102] Schön, 62

not be reset to the start point once, as General Wallace noted, "the enemy we're fighting is a bit different than the one we war-gamed against."[103] All future planning had to account for the new reality resulting from the repercussions of earlier actions. Thus, a fourth test, that any approach to wickedness must provide opportunity for an intellectually rigorous process to test the potential suitability of the proposed solution prior to impacting the system. It must then account for assessing changes in the operational environment caused by injecting that energy in order to adjust to the ever changing problem.

Sixth, "wicked problems do not have an enumerable (or an exhaustively describable) set of potential solutions, nor is there a well-described set of permissible operations that may be incorporated into the plan."[104] Because both the problem and solution are subject to the values and judgments of the design team, not to mention the whims and desires of the myriad of stakeholders, no unified exhaustive list of solutions could ever be created. This is crucial for military commanders and planners to understand. Wicked problems defy solution through the simple selection, or collection, of tactical forms found in doctrine. Additionally, a solution may require the novel application of available resources and relates very closely to the seventh property, "every wicked problem is essentially unique."[105] This most singularly captures the notion of Schön's indeterminate zones of practice that the problem cannot be handled "solely by applying theories or techniques derived from [the] store of professional knowledge."[106] According to Conklin, "there are so many factors and conditions, all embedded in a dynamic social context, that no two wicked problems are alike, and the solutions to them will always be

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[103] Bernard E. Trainor and Michael R. Gordon. *Cobra II : The Inside Story of the Invasion and Occupation of Iraq*. (New York: Pantheon Books, 2006), 311.

[104] Rittel, 164.

[105] Ibid., 164.

[106] Schön , 6.

custom designed and fitted."[107] An architect does not design to create an identical building on

identical grounds for a new location. Nor should the military planner look exclusively to doctrine

as the only option to define the form and function of the proposed military operation. The

challenge, then, becomes seeking to discover and explicitly acknowledge this novelty in order to

avoid being captivated by pattern or commonality and defaulting to solutions of past problems.

However, in seeking the novel, the practitioner cannot discard the familiar. The cognitive tension

between common pattern and exceptional circumstance provides the departure point for creative

solution. "It is our capacity to *see-as* and *do-as* that allows us to have a feel for problems that do

not fit existing rules."[108] This creates a dichotomous dance between familiar and unique, one must

be able to recognize the common condition in order to act upon the unusual situation.[109] Thus, a

fifth test to show that a successful approach must draw on both a commander's experience to

recognize the familiar aspects from which an adaptive solution can be proposed, and also

leverage the critical reasoning skills to specifically identify the unique aspects that may require

innovative solution.

Eighth, "every wicked problem can be considered to be a symptom of another problem."[110]

This can lead the practitioner towards the fallacy of *post hoc, ergo propter hoc*, "the belief that

because one thing comes after another, it comes because of the other."[111] As the layers of the

problem are peeled back, they naturally reveal other underlying and associated problems. These

layers expand in generality, scope, and complexity, and thus become more wicked than the

problem that initiated the original query. Yet, no single underlying layer will singularly resolve

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[107] Conklin, 8.

[108] Schön , 68.

[109] For a more in-depth discussion on separating the familiar from the novel see: Richard E., Neustadt and Ernest R. May. *Thinking in Time: the Uses of History for Decision-Makers.* (New York: The Free Press, 1986.)

[110] Rittel, 165.

[111] John Dewey. *How We Think.* (Buffalo, NY: Prometheus Books, 1991), 147.

the symptom that the proposed wicked problem states, raising the dichotomy of treating the symptom vice curing the problem. At some level of abstraction, the sponsor and practitioner must agree to the viability of resolving that layer of problem. Because problem and solution are inextricably combined in a wicked problem, the corollary must also be acknowledged.[112] The solution will possess both intended and unintended consequences that will manifest as either new wicked problems or exacerbated symptoms of an underlying wicked problem at a more general level of abstraction. Lawson refers to this phenomenon as the two undisciplined responses to the attempt to cope with the scale and magnitude of the problem – escalation and regression. Escalation means to develop "an ever wider definition of the problem."[113] Escalation runs the risk of problematizing above the tasked commander's ability to address the indentified problem's abstraction. Regression provides the corollary, the tendency to over-focus on one critical piece and lose sight of the systemic whole. Regression runs the risk of over emphasizing a minor component of a much larger problem (symptom vice problem) that precludes the command's ability to resolve the broader problem. Lawson warns that the rigid application of process (MDMP) tends to encourage regression. Thus, a sixth test must show that a role of the commander, in either approach, should be to retain the practitioner's efforts on the level of problem they have been tasked with accomplishing.

Ninth, "the existence of a discrepancy representing a wicked problem can be explained in numerous ways. The choice of explanation determines the nature of the problem's resolution."[114] Because wicked problems tend to emanate from the social problems of human interaction, "the choice of explanation is arbitrary in the logical sense."[115] The experience, values, and goals all

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[112] Lawson, 122.

[113] Ibid. 56.

[114] Rittel, 166.

[115] Ibid., 166.

interrelate within the observer to determine the magnitude of difference between the current state and desired state. Additionally, each observer may see unique components within the larger problem that bound and limit the problem frame and thus alter the available or preferred solution. As Lawson cautions, "design inevitably involves subjective value judgment."[116] Within the SAMS discussion, this has been more simply put as, 'naming is framing.' So, a seventh test to show that an approach to resolving ill-structured problems must balance the benefits of explanation against the risk that the proposed naming inhibits further learning on the nature of the problem.

Tenth, "the planner has no right to be wrong."[117] This is a touchstone. At the end of the day, the commander and planner remain morally culpable for the solution implemented, regardless of their personal approval or belief about its appropriateness. The practitioner works as an extension of the commander, once the design – or plan – has been approved, the planner must insure that the detail, synchronization, and coordination occur to provide every chance of its success. Although the moral implications of design – or Design – go beyond the scope of this monograph, it is important to acknowledge this significant component. There is no way to test or validate whether an approach to ill-structured problems accounts for this property. Commanders must recognize this property without freezing in inaction for fear of being wrong.

Operational problems have all of these described attributes of an ill-structured problem.[118] Therefore in order to be relevant, doctrine must provide a sufficient methodology to identify, address, and resolve ill-structured problems. This section has proposed seven tests based on the ten properties of wickedness to determine an approaches' efficacy in addressing wickedness, or

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[116] Lawson, 124.

[117] Rittel, 166.

[118] TRADOC PAM 525-5-300, 83.

ill-structured, problems. This explanation will lay the foundation to demonstrate that Battle

Command is in fact sufficient to address ill-structured operational problems.

On Battle Command

"If one has never personally experienced war, one cannot understand in what the difficulties constantly mentioned really consist, nor why a commander should need any brilliance and exceptional ability."[119]

~*Carl von Clausewitz*

Battle Command refers to the Army's doctrinal description of the role of the commander

within the Operations Process (see figure 2). The Operations Process describes the cyclic nature

of operations as they flow from Planning—the process of understanding the operational

environment and developing a plan to address the identified problem, through Preparation—the

process of arranging the command through organization and training to implement that plan, to

Execution—the employment of force to implement the plan and attend to the problem.[120]

Assessment occurs throughout the process to ensure that the plan produces the proper solution,

and that that force preparations, and execution, are moving towards successful solution.[121] Battle

Command describes the commander leading the Operations Process—a process of understanding,

visualizing, describing, and directing, while informing and adjusting through assessment.

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[119] von Clausewitz, Carl, Michael Eliot Howard, and Peter Paret. *On War* (Princeton, N.J.: Princeton University Press, 1976). 119.
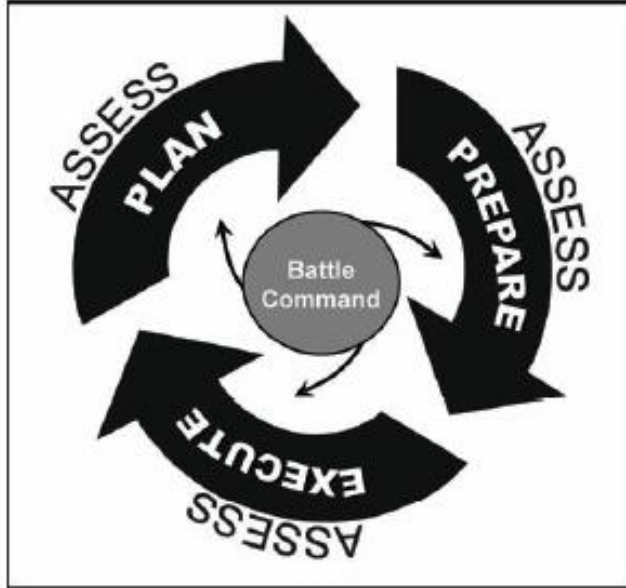
[120] FM 6-0, 6-3.

[121] Ibid*.,* 6-4.

Figure 2 – The Operations Process[122]

Doctrine defines Battle Command as "the art and science of understanding, visualizing, describing, directing, leading and assessing forces to impose the commander's will on a hostile, thinking, and adaptive enemy."[123] In understanding how Battle Command addresses ill-structured problems, it is helpful to look at the model in reverse. It allows the commander to direct the execution of the described approach to the visualized solution arrived at from an understanding of the problem. Battle Command leverages the commander's ability to direct by harnessing the results of his critical reasoning and creative thinking. When viewed this way, one can see that the cognitive process of Battle Command occurs during Understand and Visualize. Describe captures that visualization and allows the commander to Direct within the logic of his understanding to

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[122] *FM 3-0, 5-16.*

[123] Ibid., 5-2. Although somewhat out of vogue, doctrine continues to use the word "enemy" to focus the reader's attention on the 'other.' The proponents of Design seem to be schooled primarily in the current environment of counter-insurgency and peoples war where words like 'adversary', 'competitor', and 'other' have replaced the more contentious term of 'enemy.' Creative and adaptive practitioners should be able to read doctrine and see the utility of the concept regardless of the term used to describe the 'other.'

achieve the visualized solution. Commanders use Lead to progress to problematization and solution conceptualization. Assess provides the feedback loop to ensure logical continuity. From this, it also becomes clear that a complete visualization cannot occur without developing understanding; that creative thinking is connected to critical reasoning; and that solution is concomitant to problem. This clarifies what aspects of Battle Command truly have to be considered as relevant in addressing an ill-structured problem.

Although Battle Command is driven by commanders, it is not the sole purview of just that individual. Doctrine recognizes that commanders benefit from the discussion and debate with their staffs, and develop tacit and contextual knowledge through battlefield circulation with subordinate commanders.[124] The doctrinal construct of Battle Command provides the Army's clearest expression of a mechanism to address wicked problems. This recognizes both the quote at the opening of this section and Jason Pape's caution in his unpublished article, *Demysticising Design,* that "those who 'find' Design in doctrine have already 'seen' it in practice, so they read doctrine with a different lens than others who have not." [125] That is, the praxis of Battle Command expands well past the doctrinal expression of Battle Command.*[126]*

Even though it is laid out as a collection of steps, or spaces, doctrine explicitly does not provide a specified process for a commander to employ Battle Command.[127] In explaining the Commander's Visualization, doctrine does suggest, but does not mandate, activities akin to the

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[124] Ibid. 5-5.

[125] Jason M. Pape. Demystifying Design: A Collective Approach to Battle Command, (Unpublished Paper for School of Advanced Military Studies, Fort Leavenworth, KS, 2009), 6.

[126] "Practical application or exercise of a branch of learning." praxis. Dictionary.com. *The American Heritage® Dictionary of the English Language, Fourth Edition*. Houghton Mifflin Company, 2004. http://dictionary.reference.com/browse/praxis (accessed: February 10, 2009).

[127] "A series of actions, motions, or occurrences; progressive act or transaction; continuous operation; normal or actual course or procedure; regular proceeding; as, the process of vegetation or decomposition; a chemical process; processes of nature." Process. Dictionary.com. *Webster's Revised Unabridged Dictionary*. MICRA, Inc. http://dictionary.reference.com/browse/process (accessed: May 01, 2009). A process would suggest a specific approach, similar to MDMP, that has steps, tasks, and sub-tasks that guide the commander through Battle Command in a anticipatable and organized way.

Army Problem Solving Process or even a 'mini-MDMP.' Doctrine recognizes that a commander must possess the cognitive flexibility to arrive at his described visualization (intent, guidance, and CCIR) through a process comfortable to his personal learning style.
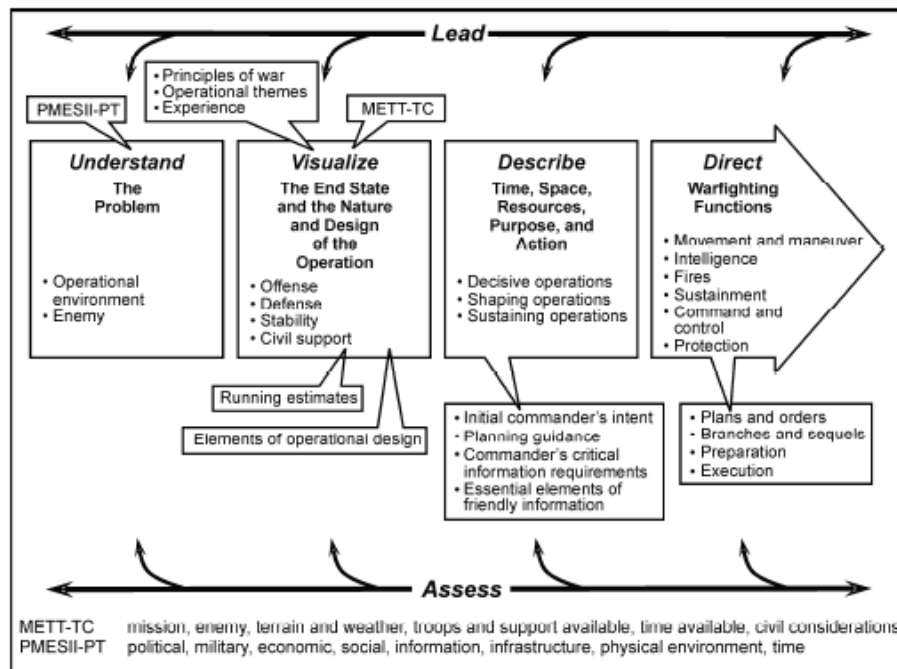

Figure 3 – Battle Command[128]

A continuing challenge to understanding Battle Command is the incorrect assumption that it only applies during the planning step of the Operations Process. In graphically depicting Battle Command the doctrine writers have, perhaps unintentionally, reduced the understanding of Battle Command. Doctrine provides a robust explanation of Battle Command through a variety of doctrinal manuals. The central graphic of Battle Command (see figure 3) shows a linear progression from Understand to Direct through distinctly separate spaces of roughly the same size. The arrows across the top and bottom attempt to demonstrate that commanders will flow back and forth between steps. This seems to indicate that each step is conducted separately and

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[128] FM 3-0, 5-3.

that all steps are equal. However, in textually explaining Battle Command, and especially the subset activity of Commander's Visualization, the errors of this graphical depiction become readily apparent. As captured in the text of doctrine, Battle Command is the interrelated development of Understand and Visualize (Commander's Visualization), captured in Describe (Commander's Intent, Planning Guidance, and CCIR), and employed in Direct (plans, orders, etc.) (see figure 4).[129] Additionally, all steps of Battle Command occur in each step of the Operations Process; that is, the commander not only directs planning, but he gains understanding in execution (see Figure 5). Recognizing that Battle Command provides a method of leadership and learning throughout the Operations Process, is critical to understanding how it serves as the doctrinal approach to addressing wicked problems.
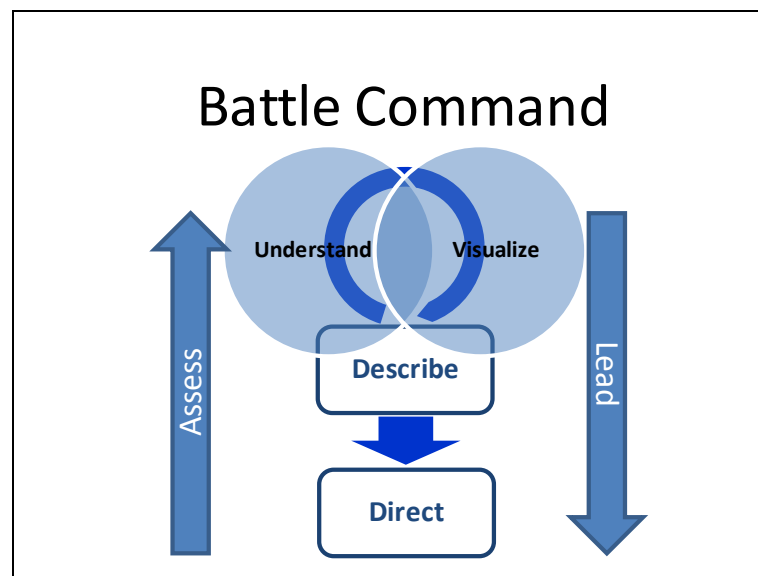
Battle Command

Figure 4 – Revised Model of Battle Command[130]

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[129] Ibid., 5-3.

[130] Figure is author's original work. It is based on the understanding of Battle Command derived from the research of this monograph. Specifically, it graphically depicts that there is a distinct "reflective conversation" between Understand and Visualize; and that Describe and Direct are clearly separate cognitive activities. Lead shows forward progress through the steps and Assess shows that each step must align with the logic derived from the previous.
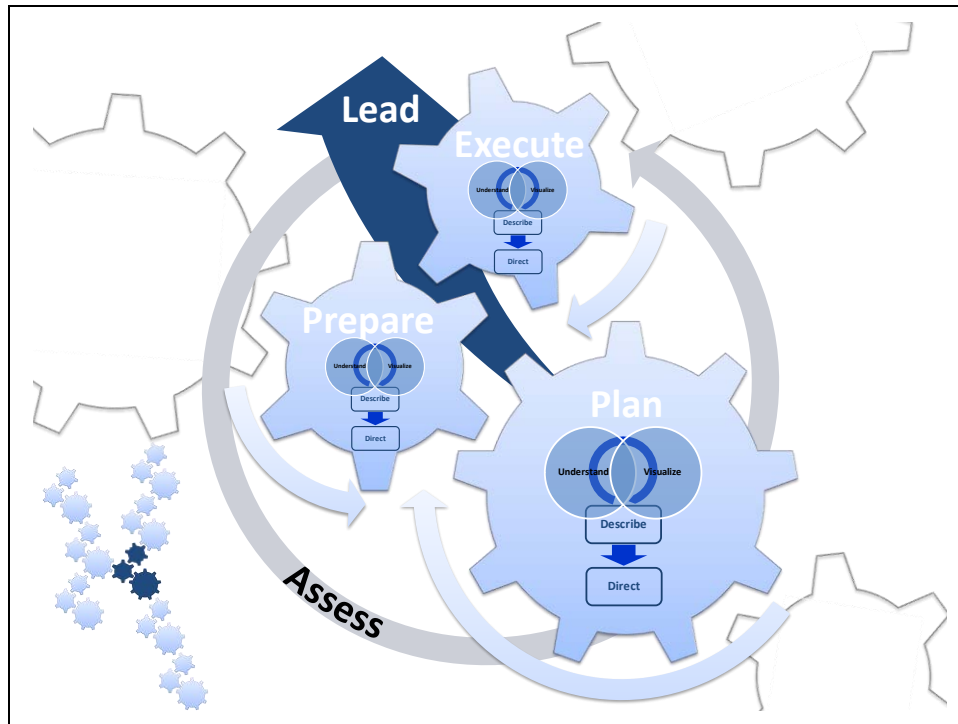
Figure 5 – Revised Model of the Operations Process[131]

A primary goal of Battle Command should be to balance the commander's need for analytic,

and thus time consuming, decision making, and the commander's ability to use intuitive decision

making. Intuition has a colloquial meaning of an insight or decision made without an observable

reasoning process.[132] However, Gary Klein in *Sources of Power: How People Make Decisions*

argues that intuition results from the ability of the professional to leverage experience to

recognize novel situations and develop informed decisions to deal with them.[133] Doctrine expands

on Klein's explanation and provides this more robust definition: "the act of reaching a conclusion

that emphasizes pattern recognition based on knowledge, judgment, experience, education,

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[131] Figure is author's original work. It graphically depicts that all steps of Battle Command occur in each step of the Operations Process. It retains the logic that Lead moves the process forward, while Assess aligns the logic with that of the previous step.

[132] "direct perception of truth, fact, etc., independent of any reasoning process; immediate apprehension." intuition. Dictionary.com. *Dictionary.com Unabridged (v 1.1)*. Random House, Inc. http://dictionary.reference.com/browse/intuition (accessed: May 01, 2009).

[133] Gary A. Klein. *Sources of Power: How People make Decisions*, (Cambridge, MA: MIT Press, 1998), 34.

intelligence, boldness, perception, and character."[134] In fact, both Klein and the doctrinal

definition seem to provide a foundational understanding of Schön's concept of the reflective

practitioner, the recognition that the current situation exceeds recognized norms and the ability to

restructure previous learning to test and then address the new and novel situation.[135] Therefore, a

successful use of Battle Command provides a mechanism for both analysis and synthesis that

allows the commander to call on his experience, relate it to the situation at hand, discover the

novelty in the difference, and propose an innovative solution.

Additionally, doctrine wrestles with Battle Command as the action of only an individual. FM

3-0 recognizes that only small unit leaders can exercise command and control as the individual

commander. Although, it can be argued that this more directly relates to the means of control and

it has implications on the ways of command.[136] The experienced practitioner recognizes that in

the praxis of Battle Command, this extends from the individual commander to a core group of

'trusted agents' which inform and assist him in developing both his understanding, the

command's available knowledge informed by the commander's judgment, as well as the

conceptualization, or design, of an approach to a solution.[137] Within the explanation of

Commander's Visualization, doctrine yields that this visualization results from "discussion and

debate between commanders and staffs."[138] FM 6-0 illustrates this evolution of situational

understanding through the development of staff documents and subordinate interaction that

cognitively move the commander from knowledge, through his applied judgment, to

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[134] FM 3-0, 5-2.

[135] Schön , 35.

[136] FM 3-0, 5-1.

[137] This should not assume that "trusted agents" assume any authorities of command, only that they assist the commander in developing his understanding and in the production of the products that inform the staff and subordinates.

[138] FM 3-0, 5-5.

understanding (see figure 6).[139] Thus, doctrine recognizes that a commander requires discursive

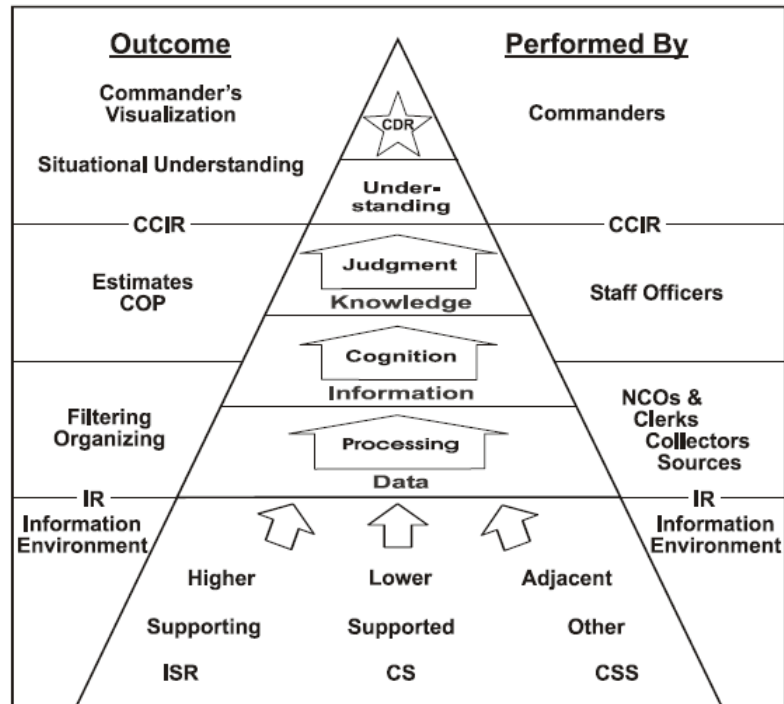input from the staff in order to properly develop an appreciation of a complex operating

environment.[140]

Figure 6 – Processing Information[141]

This discursive input draws heavily on assessment. The staff running estimates reflects an

assessment of the current operational environment filtered through the specific staff section's

domain knowledge.[142] The Commander's Visualization becomes a holistic view, informed by

these staff running estimates, battlefield circulation, and discourse with superior, adjacent, and

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[139]FM 6-0, 4-5.

[140] Just to be clear, doctrine does remain expressly clear that the responsibility and legal authorities of command remain grounded with the commander alone. This is not an argument for command as a collective, simply a recognition that understanding complexity requires a team approach.

[141] FM 6-0, 3-14.

[142] Department of the Army. Field Manual Interim (FMI) 5-0.1, *The Operation Process,* (Washington, DC: Government Printing Office, 2006), 5-1.

subordinate commanders, then filtered through the commander's experience and judgment.[143] Assessment deliberately compares forecasted outcomes to actual events to determine the overall effectiveness of force employment through a combination of monitoring and evaluation.[144] Monitoring requires the continuous observation of the current situation in order to identify both opportunities and threats.[145] Monitoring asks whether the command is solving the right problem. It most directly supports the commander's understanding. Evaluation compares the monitored information against the commander's described visualization in order to determine the validity of the proposed or implemented solution.[146] Evaluation identifies variances, confirms or invalidates assumptions, and forecasts trends.[147] Evaluation asks whether the command is correctly solving the problem. It most directly supports the commander's ability to visualize. Most importantly, the commander must not become wedded to this initial visualization, and must continue in assessing the operational environment, improving his understanding, and adjusting his visualization to both alterations in the nature of the problem as well as corrections to the veracity of the solution.

Until the publication of the most recent version of FM 3-0, the term 'Visualization' included the now separated concept of 'Understand.' Understand identifies the critical reasoning (recently changed in doctrine to critical thinking) aspects of both problem recognition and problematization. Doctrinally, the key point for critical reasoning is to make identifying the problem a distinct activity.[148] FM 6-22 explains, "Critical thinking is the key to understanding changing situations, finding causes, arriving at justifiable conclusions, making good judgments,

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[143] FM 5-0, 3-4.

[144] FMI 5-0.1, 5-1.

[145] Ibid., 5-2.

[146] Ibid., 5-2.

[147] Ibid., 5-2.

[148] Jack D. Kem, *Campaign Planning: Tools of the Trade. Second Edition*. (Fort Leavenworth, KS: U.S. Army Command and General Staff College, 2006). 7.

and learning from experience."[149] This leads to the deduction that Visualization should relate to the creative thinking aspects of the conceptualized solution. FM 6-22 further notes, "The key concept for creative thinking is developing new ideas and ways to challenge subordinates with new approaches and ideas."[150] This is a critical cognitive separation and directly contradicts how the proponents of Design explain problem formulation as a result of a creative approach. Doctrine states the result of critical thinking is the finding and identifying of the real problem.[151]

In this stratifying of understanding from visualization, doctrine has separated problem from solution. However, to fully separate 'Understanding' from 'Visualization,' or critical reasoning from creative thinking, necessarily inhibits a fuller understanding of the nature of the whole. In the separation of problem from solution, doctrine primarily seeks to add emphasis to the individual importance of each.[152] The advantage of this approach is a renewed emphasis on the commander to ensure that the right problem is identified as a discreet step of critical thinking. The disadvantage may lead some commanders to believe that one can be considered without an understanding of the other; that problem and solution are separate wholes, not informed by an understanding of the other. This would be a myopic view and fails to take into account the impact of assessment in aligning the logic of the current activity with the result of the previous.

Visualization most clearly demonstrates Clausewitz's statement that commanders must possess exceptional ability and intellect. Visualization emerges as the vehicle for creative thinking—the ability to apply the understanding developed through critical reasoning to conceptualize novel solutions. The key concept for creative thinking is developing new ideas

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[149] Department of the Army. Field Manual (FM) 6-22, *Army Leadership Competent, Confident, and Agile,* (Washington, DC: Government Printing Office, 2006), 6-1.

[150] Ibid., 6-2.

[151] Kem, 6.

[152] TRADOC TDCC, 30-31 March 2006. Slide 25. Speaker Notes.

about the nature of the problem and unique ways of approaching a solution to that problem.[153] Creative thinking can be innovative—a unique and novel solution without precedence; or adaptive—patterned on similar approaches to past situations.[154] Within an operational context, commanders constrain their creative thinking to the bounds set by the three-sided prism of the disposition of enemy forces, capability of friendly forces, and the environmental conditions and guide their conceptualization of solution with the elements of operational design. Within these bounds, the commander can then innovatively and adaptively propose broad approaches to move from the current state to the desired state.

Doctrine does not address assessment during Visualization as separate from Understanding. However, because assessment ensures the continuity of logic from the previous step to the current demands that visualization of solution requires assessment of the understanding of the problem. Therefore, as commanders visualize approaches to solution, they must continually assess how that solution impacts their understanding of the problem. Additionally, commanders must always remain cognizant of changes to enemy disposition, friendly capability, and the operational environment that impact the viability of their visualized solution.[155]

Although captured in doctrine as a subcomponent of visualization, the mental process of Commander's Visualization is really the full expression of Battle Command as it relates directly to the 'Plan' step of the Operations Process. It is "The mental process of developing situational understanding, determining a desired end state, and envisioning the broad sequence of events by which the force will achieve that end state."[156] If the concept of Design holds promise as a doctrinal construct, its natural home would be in a collective methodology to assist the

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[153] Kem, 8.

[154] FM 6-22, 6-2.

[155] FM 6-0, 4-2.

[156] FM 3-0, 5-5.

commander in developing the Commander's Visualization. It provides the products that focus

planning on providing suitable and acceptable courses of action, while focusing the command's

learning on those areas the commander requires to make informed decisions. Commander's

Visualization recognizes that Battle Command is not a four-step process, but rather a process of

two cognitive steps, Understand and Visualize, which must then be Described enabling the

commander to Direct the command in order to accomplish the end state.

   The ability to Describe the commander's Understanding and Visualization becomes the

crucible activity of Battle Command. Although the recipient of the staff's running estimates, the

tacit knowledge gained from battlefield circulation, and the ability to place the operation in to the

context of higher, lower, and adjacent operations, it is the commander's judgment alone that

consolidates that knowledge into understanding.[157] Doctrine prescribes three products for the

commander to describe his understanding and visualization, the Commander's Intent, Planning

Guidance, and Commander's Critical Information Requirements (CCIR).[158] Intriguingly, doctrine

has not yet accounted for the separation of Understanding from Visualization, nor does it require

the commander to produce any specific description or explanation of either his understanding or,

perhaps more importantly, the problematization. Commander's Intent bridges the Mission to the

Concept of Operations, provides the Key Tasks that all courses of action must accomplish

(acceptability), and establishes the commander's desired end-state condition.[159] The

Commander's Planning Guidance provides his input on the specific how of the planning process

and reinforces areas of focus that he expects the planners to address with specificity.[160] The CCIR

identify the specific information the commander requires for decision making.[161] The CCIR drive

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[157] FM 6-0, 4-5.

[158] FM 3-0, 3-5 – 3-7.

[159] Ibid. 3-5.

[160] Ibid. 3-6.

[161] Ibid. 3-7.

the command's learning. As the commander describes, he must assess how his description affects his understanding of both problem and solution. Description does not end with planning. The commander must continuously describe his understanding and visualization throughout the Operations Process.[162]

Direction is inherent in command. Although similar within Battle Command, 'Direct' and 'Lead' become two distinct activities. Commanders direct the Operations Process primarily through the publication of orders.[163] However, direction continues to occur throughout the Operations Process. For example, a commander may direct changes to a unit's task organization based on his assessment of that unit's preparation, or to take advantage of emerging opportunities during execution. Commanders lead through the use of Battle Command by guiding their forces through the Operations Process with their physical presence, strength of character, and moral courage.[164] The ability to lead confidently and resolutely emerges from understanding the nature of the problem, visualizing end state conditions, and conceptualizing the approach to achieving the end state arrived at during the Commander's Visualization. Within Battle Command, Lead reminds commanders that they cannot become bogged down in either cognitive space, Understand or Visualize. In this context, Lead means knowing when to move from understanding the problem to visualizing the solution. It also implies having the strength of character to know when to revisit understanding because the visualized solution no longer seems to be solving the right problem. Finally, commanders must remain open to the feedback and assessments of those subordinate commanders and their staff implementing the solution. By remaining open to those with the contextual and tacit knowledge of the situation, commanders ensure that they lead within the logic of the operational problem.

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[162] FM 6-0, 4-8.

[163] FM 3-0, 5-10.

[164] Ibid., 5-12.

From this explanation, a new diagram of the Commander's Visualization can be drawn (see figure 7). This drawing borrows Dr. Shimon Naveh's logical construct from SOD, but applies current Army doctrinal terms to enhance a United States military appreciation. The Understand block encompasses the entire diagram. Everything the commander does is informed by his understanding of the situation.[165] As a rectangle, it is bound by four sides to illustrate that understanding is inherently limited—a true, total, and complete understanding cannot be achieved. The triangle symbolizes the prism through which the commander filters his understand to visualize potential solutions. The filter is comprised of enemy disposition, friendly capability, and environmental condition.[166] It allows the commander to visualize a solution that compels, deters, or persuades an enemy action with the available friendly capability, and in accordance with the context, or environment, of the current situation.[167] The Visualize box becomes a subset of the understanding and defined as those aspects of the understood problem that the visualized solution can act upon. Commanders visualize the solution's form and function utilizing the factors of Mission, Enemy, Time, Terrain, Troops Available, and Civil Considerations (METT-TC).[168] Commander's then describe their visualized solution as a subset to the understood problem. They use Commander's Intent to provide the purpose of the operation, to identify the key tasks that must be accomplished to achieve the solution, and describe their desired end state conditions.[169] They then share their expanded understanding of the problem with the Commander's Planning Guidance. This allows them to provide their experience and judgment to the staff by providing specific recommendations or requirements as to how and where effort

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[165] FM 6-0, 4-2.

[166] FM 5-0, 3-4

[167] FM 5-0, 3-4. and FM 6-0, 4-5 – 4-7.

[168] FM 5-0, 3-4. and FM 6-0, 4-5 – 4-7.

[169] FM 3-0, 5-4 – 5-8.

should be expended to achieve the desired result.[170] Finally, commanders drive their learning and

ability to make informed timely decisions with CCIR.[171] Thus, this illustrated model demonstrates

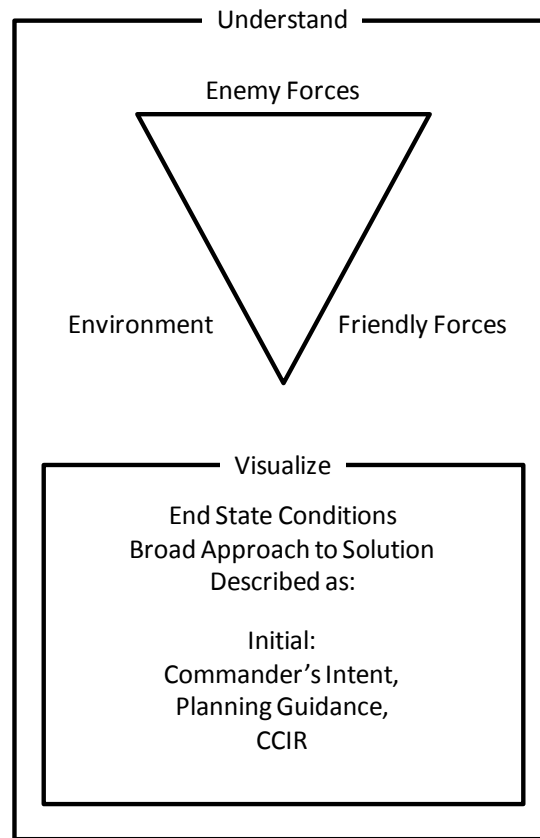that a broad understanding provides the space for an appropriate visualized solution.

Figure 7 – Revised Model of Commander's Visualization[172]

[170] FM 6-0, 4-10. FM 3-0, 5-8 – 5-9. FM 5-0, 3-6 – 3-7.

[171] FM 6-0, 4-6 and 4-9. FM 3-0, 5-8. FM 5-0, 3-7 – 3-9.

[172] Author's diagram based on the SOD overview diagram. Taken from: *Systemic Operational Design: an Introduction,* page 23. That monograph indicates, but does not cite, that it is based on "Discoursive Command – Operators – Systemic Operational Design: A New Framework for Strategic Epistemology." (Naveh, Shimon. "Discoursive Command – Operators – Systemic Operational Design: A New Framework for Strategic Epistemology." Not available for general release.)

The Battle Command Approach to Wickedness

"Battle Command is how senior leaders think through complex operational problems."[173]
~General George Casey, Chief of Staff of the United States Army

Battle Command provides a solution-focused approach to addressing ill-structured problems. Battle Command, in and of itself, only provides the framework to address the problem. Problem resolution itself becomes the outcome of the interplay between the planning and execution, based on the Commander's Visualization. As the cognitive expression of Battle Command, the Commander's Visualization provides the doctrinal approach for problem understanding informed by solution visualization. Commanders develop a situational understanding, determine a desired end state, and then conceptualize a broad sequential approach to achieve that end state.[174] Through assessment, commanders evaluate whether the proposed approach properly addresses the problem they identified as part of developing their situational understanding.[175] The commander must continuously assess the seam between the planned resolution and the resultant execution to ensure that the continuity of the logic derived during Commander's Visualization.

In Section One, this monograph laid out seven factors, based on Rittel and Webber's ten properties of wickedness, which must be addressed in order to have a successful approach to resolving wicked problems. In Section Three, the precept of Battle Command was described and explained in order to provide an appreciation for what already exists in Army doctrine. In explaining Battle Command, this monograph expanded on the baseline doctrinal details in order to demonstrate the full potential of the doctrinal precept. This section will evaluate the capacity of Battle Command to sufficiently address the seven identified factors required of an approach to

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[173] From author's discussion with GEN Casey on April 20, 2009.

[174] FM 3-0, 5-5.

[175] FM 6-0 6-4.

resolve ill-structured problems. In so doing, it will demonstrate that Battle Command provides a sufficient cognitive framework from which a commander can problematize, and then, develop an approach to resolve a wicked problem.

First, Battle Command provides for an iterative and reflective conversation between problem and solution that informs problematization through the proposal of solution. This is the very essence of an ill-structured problem, that solution visualization drives problem understanding.[176] In line with Conklin findings, commanders first try to understand the problem, often by accepting the tasks from higher as refined problematization, then delve into visualizing potential solutions, which often causes them to refine their understanding of the problem.[177] This reflective conversation must be conducted iteratively as new solutions highlight novel aspects of the problem, which in turn, illuminates other possible solutions.[178] With each repetition, the commander's problematization becomes more refined as the solution emerges from the refined problem. This iteration may occur rapidly, and almost undetected, when conducted by the commander alone.[179] Conversely, a collective discussion towards problematization could potentially go on much longer.[180] In either case, the commander must lead the cognitive process forward towards a refined problematization from which the visualized solution can be described.

Second, through Commander's Visualization, a commander continuously problematizes with the awareness that he must eventually end the reflective conversation in order to produce an accurate and timely solution. The essence of the lead function within Battle Command is the commander's ability to recognize when to end both his internal conversation between problem and solution, as well as to lead his 'trusted agents' towards a completed problematization. A

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[176] Rittel, 161.

[177] Conklin, 5.

[178] Schön, 26-30.

[179] Conklin, 12-13.

[180] Ibid., 12-13.

commander must possess a comfort in his level of understanding of both problem and solution in order to move forward. [181] Getting to this point of comfort will vary by commander and situation. The challenge with an ill-structured problem will be recognizing that comfort does not equal surety.[182] Commanders must recognize when their understanding is good enough.[183] Lead also implies having the strength of character to revisit the Commander's Visualization throughout the Operations Process to ensure that both the problematization and conceptualized solution remain valid to achieving mission success. If commanders do not continuously reassess both problem and solution, they run the risk of strategic failure, as the operational logic will fail to address the complexity of the situation.

Third, the Commander's Intent, primarily through the identification of Key Tasks, provides the unique criteria to test the acceptability and suitability of the proposed solution. A commander may seek those criteria from other stakeholders, to include higher headquarters or supported efforts orders. Doctrinally, a Course of Action is deemed acceptable if it accounts for the accomplishment of the Key Tasks as identified in the Commander's Intent.[184] This puts the onus on the commander to carefully consider and craft his Key Tasks as expressions of the needs of both the higher headquarters, as well as the desires of critical stakeholders. As commanders propose these Key Tasks, they should test their validity by asking how each task supports those needs and desires. For the commander, this test determines whether the visualized solution is suitable.[185] The doctrinal definition of suitable implies that the proposed approach resolves the problem within the limits set by the higher headquarters.[186] Thus, as the commander sets the

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[181] FM 6-0, 4-3.

[182] FM 6-22, 6-1 – 6-2.

[183] TRADOC PAM 525-5-500, 11. ; Student Text, 15-16.

[184] FM 5-0, 3-6.

[185] Ibid., 3-6, 3-29.

[186] Ibid., 3-29.

criteria for an acceptable Course of Action, he must also be testing his visualized approach to ensure it meets the requirements of both the higher headquarters and the critical stakeholders.

Fourth, doctrine provides opportunity for an intellectually rigorous process to test the potential suitability of the proposed solution prior to impacting the system through the process of Course of Action Analysis as described in the MDMP.[187] This is a particular strength of both doctrine and the military approach to the operational environment. The Commander's Visualization results in the described approach to a broadly conceptualized solution.[188] Through the process of planning, that broad concept becomes one, if not multiple, detailed courses of action.[189] Those courses of action are then wargamed as a cognitive test of their individual suitability.[190] The selected course of action then becomes the approved approach which is further tested through the preparation step in the Operations Process.[191] Optimally, all of this suitability testing takes place outside of the system pending intervention. FM 3-0 highlights this dilemma, "Commander's are aware that, once executed, the effects of their decisions are frequently irreversible."[192] This allows commanders the best possible opportunity to ensure that the success of that "one-shot."[193]

Additionally, Battle Command accounts for assessing changes in the operational environment caused by injecting that energy in to the system in order to adjust to the ever changing problem. Assessment provides for both monitoring the situation and problem, and evaluating of the

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[187] Ibid., 3-42 – 3-53.

[188] FM 3-0, 5-8.

[189] FM 5-0, 3-29 – 3-42.

[190] Ibid., 3-42 – 3-53.

[191] FM 6-0, 6-12 – 6-13.

[192] FM 3-0, 5-2.

[193] Rittel, 163.

approach or solution.[194] Through the commander's evolutionary understanding of the nature of the problem, based on his situational monitoring, he can direct adjustments by describing the refined visualization to ensure that the solution continues to solve the correct understood problem. The Operations Process, with its requirement for assessment, provides a double check mechanism to continuously assess the impact of intervention on the impacted system. Doctrine emphasizes assessment on the efficacy of the solution.[195] However, through the cyclic nature of Battle Command, commanders must continuously assess their understanding in order to validate the veracity based on their visualized solution of the ongoing operations.

Fifth, Battle Command explicitly draws on both a commander's experience to recognize the familiar aspects from which an adaptive solution can be proposed and on his ability to leverage critical reasoning skills to specifically identify the unique aspects of the problem that may require innovative solution.[196] Commanders recognize that unique situations require novel solutions. Operational problems require a creative commander who blends both innovative creativity employing a unique approach, and adaptive creativity—adjusting existing doctrinal approaches to the unique context of the problem. Most operational problems cannot be solved by simply applying doctrine. Since ill-structured problems have no defined list of potential solutions, Battle Command allows the commander to engage creative thinking in order to arrive at a truly novel solution to unique problems.

Sixth, the Lead and Assess feedback loops provide the commander the ability to focus his efforts on the level of the problem he has been tasked with accomplishing. This directly relates to the commander's responsibility to mitigate against either the escalation or regression of the

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[194] FM 6-0, 6-6.

[195] Ibid., 6-4.

[196] FM 6-22, 6-1 – 6-9. This really reflects Chapter 6 or FM 6-22, Leader Intelligence. The ability to leverage critical reasoning to apply creative thinking in order to provide both adaptive, modified from existing known solutions, and innovative, introducing something totally new, solutions.

solution. As described, Lead relates to the commander's ability to keep the process of problematization moving forward towards solution. Then, Assess provides the mechanism for the commander to ensure continuity of the current action with the logic of the previous. By balancing forward momentum with the continuity of logic, commanders keep the proposed solution focused to address the problem at the scale and scope of the organization's capability and capacity to respond.

Seventh, the doctrinal precept of Battle Command does not expressly balance the benefits of explanation against the risk that the proposed naming inhibits further learning on the nature of the problem. As a collective approach, the group of 'trusted agents' could challenge the conventional understanding of the problem by disputing the common explanation.[197] As a collective, each 'trusted agent' may see unique components within the larger problem that clarify the problem at hand and assist the commander in determining a more preferred solution.[198] The commander's challenge becomes not allowing himself, or his trusted agents, to name the problem with a common definition until its unique facets and aspects are explored completely. However, the corollary also holds true, that properly naming the problem assists in adequately dealing with the situation at hand.[199] The commander's experience, values, and goals assist him in determining the nature of the problem.[200]

Battle Command demonstrates doctrinal efficacy in addressing six of the seven factors. It is important to note that this comparison provides for the promise of doctrine as written, and does not attempt to reflect upon current training models or provide an examination of practice. What this comparison does show is that the Army has an existing construct that provides commanders

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[197] Banach and Ryan, 107.

[198] Ibid., 107.

[199] Ibid., 107.

[200] FM 5-0, 2-6 – 2-7.

and organizations the ability to understand and construct approaches to resolution of ill-structured problems. As the current operational environment expands in complexity, it becomes paramount that commanders, both present and future, steep themselves with a broad capacity to engage in critical reasoning and creative thinking skills from which a deeper problem understanding leads, and thus a more suitable solution visualization will emerge.

Conclusion

The proponents of Design advocate that existing doctrine has proven insufficient for addressing the demands of today's more complex operational environment.[201] Therefore, they believe doctrine is insufficient to resolve ill-structured problems. This monograph demonstrates that current Army doctrine provides an adequate tool to achieve the desired results as those proposed in the concepts of operational Design. This hypothesis was proved using Rittel and Webber's taxonomy to categorize ten properties of wicked problems. This monograph also provided a description and explanation of Battle Command as the central aspect of current Army doctrine that expressly allows commanders to address ill-structured operational problems. Finally, this work evaluates how the application of Battle Command provides an adequate doctrinal approach for addressing ill-structured problems. This approach logically expresses how existing practices can be leveraged to provide an approach to increasingly complex operational problems.

A problem exists when a difference between the current and desired state becomes apparent. The process of identifying and framing the difference so that the problem can be solved, or resolved, is referred to as problematization. The relative difficulty of problematization categorizes problems as well-structured, medium-structured, or ill-structured problems. The complexity of the current operational environment categorizes most strategic and operational problems as ill-structured. Although doctrine describes ill-structured problems, Rittel and Webber's work on

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[201] Banach, 97. and Wass de Czege, 2.

"Wicked Problems" provides a more complete explanation of categorizing and addressing ill-structured problems. The essential nature of ill-structured problems is that problematizing them is the problem. Ill-structured problems remain defiant against an easily defined or accepted definition due to the very nature of having multiple stakeholders that view the very existence of the problem from different perspectives.[202] Commanders must possess the ability to address ill-structured problems in order to devise potential solution sets to resolve them.[203]

Doctrinally, Battle Command explains the interaction between understanding and visualization in order to describe an approach from which the commander can direct and lead operations. Understanding utilizes critical reasoning to explore the true nature of the problem before the organization.[204] Visualization employs creative thinking to exploit the reasoned understanding of the problem to propose adaptive and innovative approaches to resolution.[205] Commanders must then describe that visualization as Commander's Intent, Planning Guidance, and CCIR to subordinates and staff to ensure a shared understanding from which to direct the operation.[206] The commander's ability to direct operations manifests itself both from orders developed from the described visualization, and from his understanding that allows intuitive decision making during execution. Additionally, the precept of Battle Command permeates doctrine. It exists as a part of the Army's leadership, operational, and planning doctrine. This ensures that the concept nests with the balance of doctrine. The products of Battle Command are the anticipated and necessary inputs to the planning process. Doctrine also recognizes that Battle Command is continuous; that understanding the problem and visualizing the solution remain cognitively fluid throughout the Operations Process.

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[202] TRADOC PAM 525-5-500, 10.

[203] Ibid., 12.

[204] Kem, 7.

[205] Ibid., 9.

[206] FM 3-0, 5-8 – 5-9.

Battle Command's continuous focus on the relationship between problem and solution allows the commander to constantly address the ill-structured problems resident in the current and complex operational environment. Since comprehending an ill-structured problem requires proposing solution, it requires a reflective conversation between problem and solution that continuously informs the commander about both the nature of the problem, as well as the efficacy of the approach to solution. This iterative and reflective conversation leverages the skills of both critical reasoning and creative thinking to provide the commander with an adequate approach to addressing ill-structured problems. Thus, current Army doctrine, through the application of Battle Command, provides the military professional an adequate tool to achieve the desired results as those proposed in the concepts of operational design.

Finally, it is important to acknowledge the context of the doctrinal situation at the time of publishing of this monograph. Training and Doctrine Command (TRADOC) has agreed to incorporate the concepts of Design into current operational doctrine.[207] Currently, Design will be a chapter in the pending revision of FM 5-0, *The Operations Process*.[208] Although this monograph finds that the existing structure of Battle Command proves sufficient for addressing ill-structured problems, it also finds that structure to be without procedural form. For some, the unbounded application of critical reasoning and creative thinking provides sufficient guideline for educated and trained commanders to approach the complex operational environment.[209] The proponents of Design argue for a technique, or procedure, to guide both the commander's thinking, as well as to formally integrate staff action into a collaborative form of command.[210] As

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[207] Department of the Army. "Issue Paper: Army Design Doctrine." (*Design*. Ft. Leavenworth, KS, March 29, 2009). Cited only to demonstrate TRADOC's assimilation of Design into doctrine. Source not utilized as an example or reference of Design principles.

[208] Ibid., iv. Cited only to demonstrate that TRADOC intends to incorporate Design into the FM 5.0 revision.

[209] See Kem, Chapter One.

[210] Banach and Ryan, 114; Banach, 100; Wass de Czege, 7-8;

indicated in the diagram concluding Section One, Battle Command may provide the doctrinal

architecture required to integrate Design from a concept into doctrine. Thus, this monograph

accepts Jim Collins' visionary mentality of embracing the "genius of the And" and rejecting the

"tyranny of the Or and the ability to embrace both extremes of a number of dimensions at the

same time."[211]

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[211] James C. Collins and Jerry I. Porras. *Built to Last: Successful Habits of Visionary Companies*
(New York : HarperBusiness Essentials, 2002), 44.

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